Studies on the Swelling of P o l y v inyl Alcohol. (VIII) : Swelling of Perfectly Deesterified Polyvinyl Alcohol Films with Various Degrees of Polymerization

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mol %), has a marked disturbing influence on the crystallization. However, in the heat treatment above 160°C this effect disappears.

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Swelling of Perfectly Deesterified Polyvinyl Alcohol Films with Various Degrees of Polymerization

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Chemistry of High Polymer, Japan (*Kobunshi Kagaku*), **14**, 150 (1957)

The relation between the degree of polymerization, swelling and crystallinity of polyvinyl alchol films were discussed in Part I. On the other hand, in the preceeding paper, it was found that the residual acetyl group had a great influence on these properties. Then, a new series of experiments was undertaken with perfectly deesterified polyvinyl alcohols. DP's of the fractionated polyvinyl alcohols were as follow : 140, 310, 500, 1120, 1683, 2042, 2570, and 3631. In the polyvinyl alcohols of lower DP's (<500), the effects of DP on the swelling, solubility and density were considerably observed at lower temperature of heat treatment. In polyvinyl alcohols of DP greater than 500 however, the relation between the swelling and crystallinity could be given by a single curve independent of the DP and the temperature of the heat treatment. The linear relation ship between the density and the crystallinity B was also found.

Studies on the Swelling of Polyvinyl Alcohol. (IX)

Swelling of Films Prepared from Mixture of Two Kinds of Polyvinyl Alcohols with Different Degree of Polymerization

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Fractionated polyvinyl alcohols with DP 140 and 3370 were selected. These polyvinyl alcohols were mixed in aqeous solution in various proportions and mixture films were prepared. They were air-dried and subjected to the heat treatment. When the temperature of the heat treatment and the content of the lower molecular weight portion are not so high, the lower molecular weight portion dissolves out by the swelling, and the degree of swelling is mainly effected by the higher molecular weight portion. So long as the mean degree of polymerization is the same, the heterogeneity has not a great influence on the swelling properties of the films.